Watershed Report

St. Joseph. Indiana, Michigan.

Land Use

	Total (Ac.)	Crops (Ac.)	% of Total	Forest (Ac.)	% of Total	Water/Wetland (Ac.)	% of Total	Pasture/Hay (Ac.)	% of Total	Urban (Ac.)	% of Total	No Data (Ac.)	% of Total
<u>Dekalb</u>	7,830	4,731	0.44	892	0.08	36	0.00	0	0.00	222	0.02	74	0.01
<u>Elkhart</u>	292,228	107,086	9.89	21,075	1.95	4,018	0.37	4,370	0.40	29,741	2.75	171	0.02
Kosciusko	60,253	32,842	3.03	4,994	0.46	5,684	0.52	367	0.03	2,527	0.23	28	0.00
Lagrange	247,490	99,739	9.21	27,008	2.49	3,318	0.31	3,679	0.34	8,509	0.79	1,754	0.16
<u>Noble</u>	203,581	101,305	9.35	27,756	2.56	2,707	0.25	677	0.06	7,429	0.69	1,972	0.18
St Joseph	115,201	28,324	2.61	11,561	1.07	2,676	0.25	315	0.03	40,342	3.72	2	0.00
Steuben	156,669	62,837	5.80	25,796	2.38	5,019	0.46	0	0.00	8,943	0.83	2,282	0.21
Totals	1.083.252	436.863	40.33	119,082	10.99	23.458	2.17	9.407	0.87	97,713	9.02	6.282	0.58

Data Source = National Ag Statistics Service, 2006, http://www.nass.usda.gov/research/Cropland/SARS1a.htm)

% Crop = Sum of the acres of corn, soybeans, wheat, other small grains, etc. divided by the total acres in the watershed.

% Pasture/Hay = Sum of the acres of pasture, hay, and idle land divided by the total acres in the watershed.

% Forest = Sum of the acres of forest land divided by the total acres in the watershed.

% Urban = Sum of the acres of residential and urban land divided by the total acres in the watershed.

% Water/Wetland = Sum of the acres of streams, lakes, ponds, etc. divided by the total acres in the watershed.

% Data Not Available = Sum of the acres of clouds on arial photographs divided by the total acres in the watershed.

	Pu	Public Lands						
	Public Lands (Ac.)	% of Total						
<u>Dekalb</u>	0	0.00						
<u>Elkhart</u>	1,403	0.13						
Kosciusko	2,140	0.20						
<u>Lagrange</u>	10,366	0.96						
<u>Noble</u>	6,435	0.59						
St Joseph	367	0.03						
Steuben	6,407	0.59						
Totals	27 118	2 50						

Data Source = Indiana Department of Natural Resources (State-Managed Lands), 2004; Hoosier National Forest - U.S. Forest Service, 2004 and Patoka River USFWS, 2003 (Federal-Managed Lands)

% Public = Sum of the acres of federal, state, and local government land divided by the total acres in the watershed.

	Cropland Types													
	Past Crop (Ac.) % of Total Corn (Ac.) % of Total Wheat (Ac.) % of Total Other (Ac.) % of Total Hay (Ac.) % of Total Grass													
	Crop (Ac.)	% of Total	Corn (Ac.)	% of Total	Wheat (Ac.)	% of Total	Other (Ac.)	% of Total	Hay (Ac.)	% of Total	Grass (Ac.)	% of Total		
<u>Dekalb</u>	4,731	0.44	2,078	0.19	280	0.03	114	0.01	0	0.00	1,717	0.16		
<u>Elkhart</u>	107,086	9.89	59,204	5.47	2,505	0.23	10,251	0.95	4,370	0.40	99,510	9.19		
<u>Kosciusko</u>	32,842	3.03	18,556	1.71	486	0.04	1,165	0.11	367	0.03	13,890	1.28		
<u>Lagrange</u>	99,739	9.21	46,951	4.33	3,739	0.35	13,087	1.21	3,679	0.34	72,455	6.69		
<u>Noble</u>	101,305	9.35	47,810	4.41	4,844	0.45	3,840	0.35	677	0.06	60,226	5.56		
St Joseph	28,324	2.61	17,296	1.60	619	0.06	1,059	0.10	315	0.03	31,597	2.92		
<u>Steuben</u>	62,837	5.80	29,803	2.75	3,727	0.34	1,299	0.12	0	0.00	47,806	4.41		
Totals	436,863	40.33	221,698	20.47	16,199	1.50	30,815	2.84	9,407	0.87	327,201	30.21		

Data Source = National Ag Statistics Service, 2006, http://www.nass.usda.gov/research/Cropland/SARS1a.htm)

% Corn = Acres of corn divided by the sum of all row crop, hay, and pasture acres in the watershed.

% Beans = Acres of soybeans + double-crop soybeans/wheat divided by the sum of all row crop, hay, and pasture acres in the

% Wheat = Acres of wheat divided by the sum of all row crop, hay, and pasture acres in the watershed.

% Other Row Crop = Difference of the sum of the acres of corn, soybeans, wheat, hay, and pasture minus total cropland acres in

the watershed divided by total crop, hay, and pasture acres in the watershed. **% Hay** = Acres of hay divided by the sum of all row crop, hay, and pasture acres in the watershed. **% Pasture** = Acres of pasture divided by the sum of all row crop, hay, and pasture acres in the watershed.

Ac. = Acres

% = Percent

T & E = Threatened and Endangered

CFO = Confined Feeding Operation

CAFO = Concentrated Animal Feeding Operation

AU = Animal Units

Ft. = Feet

= Number

Mi. = Miles

	Beef and Swine Processing								
	Beef Plants Beef Animals Swine Plants Swine Animals								
<u>Dekalb</u>	0	0	0	0					
<u>Elkhart</u>	2	2,070	2	1,649					
<u>Kosciusko</u>	0	0	0	0					
<u>Lagrange</u>	2	1,987	2	1,871					
<u>Noble</u>	0	0	0	0					
St Joseph	0	0	0	0					
<u>Steuben</u>	0	0	0	0					
Totals	4	4,057	4	3,520					

Data Source = Indiana Board of Animal Health, 2006 (Slaughter Processing), http://www.in.gov/boah/food_safety/inspection/meat_poulty.html

	Confined Livestock 2006											
	CAFO/CFO	Dai Farms			eef Animals	Sv Farms	wine Animals	Poi Farms	ultry Animals	She Farms	ep Animals	
<u>Dekalb</u>	1	0	0	1	100	0	0	0	0	0	0	
<u>Elkhart</u>	33	9	2,246	2	460	26	52,206	4	113,500	0	0	
<u>Kosciusko</u>	12	1	355	0	0	9	13,810	2	86,500	0	0	
<u>Lagrange</u>	24	3	688	4	1,860	18	28,387	2	161,000	0	0	
<u>Noble</u>	21	4	2,851	2	55	17	51,780	0	0	0	0	
St Joseph	5	0	0	1	125	3	9,086	2	361,000	0	0	
<u>Steuben</u>	3	1	1,500	1	100	2	5,760	0	0	0	0	
Totals	99	18	7,640	11	2,700	75	161,029	10	722,000	0	0	

Data Source = Indiana Department of Environmental Management, Office of Land Quality, 2007, http://www.state.in.us/idem/agriculture/livestock/cfo/index.html Confined Animal Feeding Operation (CAFO) = (U. S. Environmental Protection Agency definition) Operations with at least one of the following: 200 dairy cows; 300 vael calves; 300 beef cattle; 750 swine 55 pounds or more; 3000 swine under 55 pounds; 150 horses; 3000 sheep or lambs; 16,500 turkeys; 9000 chickens (liquid manure); 25,000 chickens - laying hens (not liquid manure); 37,500 chickens - not laying hens (not liquid manure); 1,500 ducks (liquid manure); or 10,000 ducks (not liquid manure). Confined Feeding Operation (CFO) = (Indiana Department of Environmental Management definition) = Operations with at least one of the following: 300 cattle; 600 swine or sheep; or 30,000 poultry.

Biofuel Plants Ethanol Biodiesel Dekalb 0 Elkhart 0 Kosciusko Lagrange Noble 0 0 St Joseph 0 0 Steuben 0 0 Totals

Data Source = Indiana Department of Transportation, 2006 (Biofuels Processing),

http://www.in.gov/isda/biofuels/

Surface and Groundwater Resource Concern Areas

	Impaired Streams (Mi.)	Impaired Lakes (Ac.)	Wellhead Protection (Ac.)	Karst (Ac.)	% Karst
<u>Dekalb</u>	0.00	0	104	0	0.00
<u>lkhart</u>	120.53	0	16,058	0	0.00
<u>Kosciusko</u>	18.13	0	9,768	0	0.00
<u>agrange</u>	27.55	0	3,983	0	0.00
<u>Noble</u>	35.16	0	8,690	0	0.00
St Joseph	23.90	0	17,740	0	0.00
Steuben	22.15	0	8,812	0	0.00
Γotals	247.42	0	65,156	0	0.00

Data Source (Impaired Water Bodies) = Indiana Department of Environmental Management 303(d) List, http://www.state.in.us/idem/programs/water/303d/index.html 303(d)-listed streams = are impaired waterbodies that have been identified by IDEM as exceeding threshold limits of specific

303(d)-listed streams = are impaired waterbodies that have been identified by IDEM as exceeding threshold limits of specific contaminants.

Data Source (Wellhead Protection Areas) = Indiana Department of Environmental Management, http://www.in.gov/idem/programs/water/swp/whpp/>

Data Source (Karst) = Karst Data, 2002, Indiana NRCS, data unpublished

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Soils-Based Resource Concerns and Analyses

		Hydric (Ac.)	%	Leaching Index >= 10 (Ac.)	%	Subsurface Drainage= H/VH (Ac.)	%	Soil Erosion (Wind) >500 (Ac.)		Potential for Frequent Flooding (Ac.)	%	Surface Runoff Class =H/VH (Ac.)	%	Soil Erosion (Water) >37 (Ac.)	%	Sheet/Rill Erosion Potential Between 1T & 2T (Ac.)	%	Sheet/Rill Erosion Potential >=2 (Ac.)	%
1	<u>Dekalb</u>	2,119	0.20	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ē	<u>Elkhart</u>	57,510	5.31	129,142	11.92	22,916	2.12	163,849	15.13	6,187	0.57	7,590	0.70	10,623	0.98	885	0.08	0	0.00
<u> </u>	<u>Kosciusko</u>	18,028	1.66	16,896	1.56	6,076	0.56	10,016	0.92	0	0.00	2,886	0.27	2,172	0.20	58	0.01	0	0.00
1	<u>agrange</u>	62,140	5.74	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
1	<u>Noble</u>	57,716	5.33	23,773	2.19	45,274	4.18	84,057	7.76	566	0.05	31,522	2.91	32,813	3.03	5,727	0.53	0	0.00
9	St Joseph	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
5	<u>Steuben</u>	35,377	3.27	29,473	2.72	36,830	3.40	71,974	6.64	2,530	0.23	30,714	2.84	25,322	2.34	2,093	0.19	0	0.00
- -	Γotals	232,890	21.50	199,284	18.40	111,096	10.26	329,897	30.45	9,283	0.86	72,712	6.71	70,930	6.55	8,763	0.81	0	0.00

Data Source (Hydric Soils) = NRCS Soil Data Mart (2007) - https://soildatamart.nrcs.usda.gov/. A soil mapunit was considered hydric if a majority of its component soils is hydric.

Data Source (Sheet/Rill Erosion Potential) = NRCS Soil Data Mart, 2007, http://soildatamart.nrcs.usda.gov/ and the Revised Universal Soil Loss Equation, Version 2 (RUSLE2). Erosion potential is based on the RUSLE2 calculation for the soil with a "C" Factor equal to that of a typical cropland management system used in Indiana (no-till soybeans, followed by chisel-plowed corn with an injected anhydrous application). Soils under this management system between 1 and 2 times of tolerable limits are eroding above sustainable levels; soils under this management system greater than 2 times of tolerable limits may be ineligible for certain USDA benefits. Management systems that leave more residue on the surface, those with less soil disturbance, crop rotations with higher-residue crops, etc. will decrease soil erosion compared to those under the typical cropland system. Management systems that leave less residue, disturb the soil more, and those with crop rotation with lower-residue crops may increase soil erosion above the typical cropland system.

Data Source (Leach Index, Wind Erosion, Water Erosion, Flood Potential, and Surface and Subsurface Drainage) = NRCS Soil Data Mart, 2007, https://soildatamart.nrcs.usda.gov/ and the NRCS Indiana Nutrient Management (590) Standard (Section IV of the Indiana Electronic Field Office Technical Guide (eFOTG)) http://efotg.nrcs.usda.gov/efotg locator.aspx?map=IN>. NOTE: Because climatic and other data elements may be county-based, threshold values may differ among adjacent counties and result in abrupt data thresholds.

Hydric soils = Characterized by, relating to, or requiring an abundance of water, hydric soils are indicators of wetlands, which represent unique management considerations including groundwater impacts, crop production limitations, wildlife considerations, etc. A soil mapunit was considered hydric if a majority of its component soils is hydric.

Leach Index = soils with a relatively high risk of water percolating below the crop root zone; developed using annual precipitation, rainfall distribution data and hydrologic soil groups.

Subsurface Drainage = soils with a relatively high risk of having subsurface drainage; determined from a matrix based on soil drainage class and depth to seasonal high water, and the presence of artificial subsurface drainage and surface

Soil Erosion (Wind) = soils with a relatively high risk of eroding by wind; determined from a location's C (Climate) Factor and a soil's Soil Erodibility Index (I).

Flooding Potential = soils with a relatively frequent risk of being covered by flowing water from any source; determined from the NRCS soil survey.

Surface Runoff Class = soils with a relatively high relative risk of soil solution movement from the surface of a management unit; determined using soil permeability and percent slope.

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			1	Water Re	sources				
	Standing Water (Ac.)	Streams (Mi.)	1st Order (Mi.)	2nd Order (Mi.)	3rd Order (Mi.)	4th Order (Mi.)	5th Order (Mi.)	6th+ Order (Mi.)	Stream Order Unavailable (Mi.)
<u>Dekalb</u>	75	3.32	3.32	0.00	0.00	0.00	0.00	0.00	0.00
<u>Elkhart</u>	2,156	463.05	222.18	90.07	38.72	37.06	19.32	44.20	11.51
<u>Kosciusko</u>	4,681	81.49	38.89	21.87	3.46	15.56	0.00	0.00	1.72
<u>Lagrange</u>	7,587	309.73	166.03	47.48	58.20	8.68	20.42	0.00	8.92
<u>Noble</u>	5,962	282.52	157.80	65.26	13.94	32.24	9.49	0.00	3.80
St Joseph	166	134.24	70.71	34.58	2.81	2.08	0.00	19.11	4.95
Steuben	8,205	180.67	99.55	38.70	40.96	0.00	0.00	0.00	1.47
Totals	28,833	1,455.04	758.48	297.96	158.08	95.62	49.22	63.31	32.37

Data Source = National Hydrography Data - U.S. Geological Survey, 2006, http://www.horizon-systems.com/nhdplus/>

Stream Order = A hierarchal stream classification system. The confluence of two first order streams forms a second order stream; the confluence of two second order streams forms a third order stream; etc. Generally, larger order streams (such as the Ohio or Mississippi Rivers) have more volume, depth and channel width. They also are located in the lower reaches of watersheds. First order streams (unforked or unbranched streams) are in the upper reaches of watersheds.

Air	Resource	Concern	Areas

	70 OI
	Watershed
<u>Dekalb</u>	0.00
<u>Elkhart</u>	26.96
<u>Kosciusko</u>	0.00
Lagrange	0.00
Noble	0.00
St Joseph	10.62
Steuben	0.00
Totals	37.58

Data Source = Environmental Protection Agency, 2006, data no longer published. 2007 data is available

http://www.epa.gov/air/data/nonat.html?st~IN~India

Habitat	

% of Watershed Within Range of Known T & E Species	Natural Communities (Ac.)	Permanent Easement (Ac.)	% of Watershed in Permanent Easement
 Known T & E			

182,518 16.85 6,619 54,610 5.04

Data Source (Threatened & Endangered Species and Natural Communities) = Indiana Department of Natural Resources, Division of Nature Preserves; Analysis by NRCS, 2007, data source is not public. Habitat ranges indicate the likely life-history range surrounding known locations of threatened & endangered species (state and federal listed) that have the potential to be used by the species (ranges for plants = point - 0 miles; amphibians/reptiles/insects/aquatic species = ¼ - ½ mile; mammals/birds = 1 mile).

Data Source (Natural Communities) = Areas identified and classified by the IDNR as unique/rare (data include the Natural Community acreage + ¼ mile buffer), data not published.

 $\textbf{Data Source} \ (\text{Permanent Easements}) = \text{Indiana NRCS (Wetlands Reserve Program), 2007,} \\ \\ \text{data not published}$

Farm Census Data													
	Farms	Farms <10 Ac.	Farms <50 Ac.	Farms <180 Ac.	Farms <500 Ac.	Farms <1000 Ac.	Farms >1000 Ac.	Minority Farmers	Full Time Farmers	Part Time Farmers			
<u>Dekalb</u>	34	3	11	12	5	2	1	0	4	17			
<u>Elkhart</u>	1,480	254	528	441	170	59	28	14	249	746			
<u>Kosciusko</u>	222	25	69	71	31	16	10	1	35	109			
<u>Lagrange</u>	1,551	142	503	757	80	39	30	9	365	732			
<u>Noble</u>	775	46	262	301	100	43	23	8	100	425			
St Joseph	341	39	139	80	50	20	13	6	49	156			
Steuben	514	25	171	207	77	23	11	8	73	259			
Totals	4,917	534	1,683	1,869	513	202	116	46	875	2,444			

Data Source = National Ag Statistics Service 2002 Census of Agriculture (http://www.nass.usda.gov/census/census02/volume1/in/index2.htm). Estimates for each watershed were derived from county values based on the percentage of each county in the watershed.

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NRCS Practices

Year:	Vegetative Agronomic Practices (Ac.)	No Till (Ac.)	Mulch Till (Ac.)	Upland Buffers (Ft.)	Aquatic Buffers (Ac.)	Grazing Practices (Ac.)	Nutrient Mgt. (Ac.)	Pest Mgt. (Ac.)	Irrigation (Ac.)	CNMPs (#)	Gully Control Grassed Waterway (Ac.)	Gully Control Other (#)	Wildlife Habitat (Ac.)	Forestry Practices (Ac.)	Confined Livestock Waste Storage (#)	Wetland Practices (Ac.)
2007	92	5,758	2,952	33,411	180	864	5,349	4,397	249	5	6	1	2,656	201	1	1
2006	0	1,002	146	0	0	935	0	5,792	- 0	6	0	Ó	745	99	0	8
2005	0	2,172	4,848	35,136	181	1,781	0	4,336	0	94	0	0	136	167	0	4
2004	0	1,987	2,754	64,634	190	941	0	0	0	0	0	0	295	132	0	220
2003	0	2,360	4,267	97,318	412	541	0	6,571	0	0	0	0	1,123	289	0	24
2002	0	951	751	212.697	371	706	0	3.372	0	0	0	0	1.716	216	0	141

Data Source = NRCS Performance Results System Reports, 2007, http://ias.sc.egov.usda.gov/prshome/index.aspx.

Vegetative Agronomic Practices = Acres of Conservation Cover (327) + 342 (Critical Area Planting) + 340 (Cover Crops) practices installed in the given fiscal year.

No-Till = Acres of Residue + Tillage Management, No-Till/Strip Till/Direct Seed (329) + Residue Management, No-Till/Strip Till (329A) practices installed in the given fiscal year.

Mulch-Till = Acres of Residue + Tillage Management, Mulch Till (345) + Residue Management, Mulch Till (329B) practices installed in the given fiscal year.

Upland Buffers = Feet of Field Border (386) + Windbreak/Shelterbelt Establishment (380) + Hedgerow Planting (422) + Windbreak/Shelterbelt Renovation (650) practices installed in the given fiscal year.

Aquatic Buffers = Acres of Filter Strips (393) + Riparian Forest Buffers (391) practices installed in the given fiscal year.

Grazing Practices = Acres of Prescribed Grazing (528 and 528A) + Pasture and Hayland Planting (512) practices installed in the given fiscal year.

Nutrient Mgmt = Acres of Nutrient Management (590) + Waste Utilization (633) practices installed in the given fiscal year.

Pest Mgmt = Acres of Pest Management (595) practices installed in the given fiscal year.

Irrigation = Acres of Irrigation System, Microirrigation (441) + Irrigation System, Sprinkler (442) + Irrigation System, Sprinkler (442) + Irrigation System, Sprinkler (442) + Irrigation System, Sprinkler (443) + Irrigation System, S

CNMPs = Number of Comprehensive Nutrient Management Plans written in the given fiscal year.

Gully Control - grassed waterways = Acres of Grassed Waterway (412) practices installed in the given fiscal year.

Gully Control - other = Acres of Grade Stabilization Structure (410) + Water and Sediment Control Basin (638) practices installed in the given fiscal year.

Wildlife habitat = Acres of Upland Wildlife Habitat Management (645) + Wetland Wildlife Habitat Management (647) + Restoration and Management of Rare and Declining Habitats (653) + Early Successional Habitat Development/Management (647)

practices installed in the given fiscal year.

Forestry Practices = Acres of Tree/Shrub Establishment (612) + Forest Stand Improvement (666) practices installed in the given fiscal year.

Confined Livestock Waste Storage Facilities = Number of Waste Storage Facility (313) + Composting Facility (317) + Waste Treatment Lagoon (359) practices installed in the given fiscal year.

Wetland Practices = Acres of Wetland Restoration (657) + Wetland Creation (658) + Wetland Enhancement (659) practices installed in the given fiscal year.

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= Number Mi. = Miles